



514840

A. Utilities**1. Electric Power**

(Northern States Power Co.)

- a. Motors - 378 HP = 505.6 KW
- b. Lights - 10.5 KW
- c. Connected Load = 588.3 KW
- d. Power Factor = not available
- e. Transformer Data-

- 1) 4000/240 supplies fire pump at plant entrance.
- 2) 4000/240, 3-75 KVA, supplies refinery area and air compressor.
- 3) 4000/240 3-37 KVA, supplies adzing and boring building and inciner.
- 4) 4000/480, 3-26 KVA, supplies power saws.

f. Demand (1953), monthly

Range 180 to 180.5 KW

Average 154

g. Consumption (1953), monthly

Range 16,100 KWH to 22,080 KWH/month

Average 19,040 KWH

h. Auto in use:Commercial Service (22,000)

First 200 KWH per month at 5.0¢/KWH

Next 300 " " 4.5 "

Next 1600 " " 3.8 "

Excess " " 2.7 "

All energy in excess of

200 KWH per month per KW

of demand 1.7 "

Discounts: 5% where customer takes service at primary voltage.

5% for payment within the discount period.

Fuel Clause: .02¢/KWH for each 1¢ above or below 26¢ per million BTU fuel cost, shall be added or subtracted from all energy charges in the 2.7¢ and 1.7¢ range.

Power Factor: Demand multiplied by 20% and divided by actual power factor in percent.

Minimum Charge:**Secondary Voltage -**

\$3.00 plus \$.50 per KVA of connected load of motors over 1/2 HP.

Primary Voltage -

Same as for Secondary Voltage, or at option of customer, \$1.35/KW demand but not less than \$8.75.

i. Other Available Rates:General Power Service (22,000)

First 20 hours use per month of demand at 5.0¢/KWH

Next 180 " " 3.0 "

Excess " " 1.8 "

Discounts:

First 50.00 of monthly gross bill 0%

Next 50.00 " " " " 10,-

Next 50.00 " " " " 20,-

Next 50.00 " " " " 30,-

Next 50.00 " " " " 40,-

Excess " " " " " 25,-

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If paid within the discount period 5%.

Minimum charge:

\$1.00 plus 0.50 per KVA for all over 1 KVA connected load.

Large Commercial Service (25,511)

Demand charge for Secondary Voltage service -

First 10 KVA demand at \$3.50/KVA per month

Next 40 " 2.50 " " "

Next 50 " 2.25 " " "

Next 100 " 2.00 " " "

Excess 1.75 " " "

Demand charge for Primary Voltage service -

Same as above less \$.20 per month per KW demand.

Energy Charge -

First 2,000 KWH per month at 3.5¢/KWH

Next 3,000 " " " 2.5 " "

Next 10,000 " " " 1.5 " "

Next 50,000 " " " 1.3 " "

Next 60,000 " " " 1.15 " "

Next 100,000 " " " 1.05 " "

Excess " " " .97 " "

Discount: 5% if paid within the discount period.

Power Factor Adjustment: Same as rate 22.031

Fuel Clause: Same as rate 22.031.

Large Industrial Service (27,711)

Demand charge for Secondary Voltage service -

First 100 KVA demand at \$1.00/KVA per month

Next 100 " " " 1.35 " " "

Excess " " " 1.27 " " "

Demand charge for Primary Voltage service -

Same as above less .15 per month per KVA demand.

Energy charge -

First 10,000 KWH per month at 1.75¢/KWH

Next 10,000 " " " 1.50 " "

Next 30,000 " " " 1.35 " "

Next 50,000 " " " 1.05 " "

Excess " " " .94 " "

Discount: 5% if paid within the discount period.

Fuel Clause: Same as rate 22.031.

j. Cost (1958), monthly

Range \$422.67 to \$570.53/month

Average \$463.33

2. Water

The plant maintains three wells, all tested and approved for drinking by the state. Plant water is furnished by the 12" well which discharges into a pond by an air lift from which it is pumped into the plant 4" water main. This main contains approximately 40 small water plugs; and possibly, for several wet areas around the plant. The water is considered to be bad because of the pond and has a disagreeable odor. It is used in the boilers, one wash room, and the refinery. Pressure in this main is approximately 75 psi at the pump.

No water meters are installed.

No figures on consumption are available.

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City water from the village of St. Louis Park may be had at the following rates:

\$1.50 per 100 cubic feet.

Quarterly minimum charge = never charge.

3. Fuel

I. Coal - 1-1/4"

(Northwestern Hanna Fuel Company)

(Youngstown & Ohio Coal Company)

Coal is used only in the 130 ft H.P. boiler.

Consumption (1958) 135 tons

Average delivered rate \$10.50/ton

Cost, total \$1,343.15

II. Fuel Oil

(Northwestern Refining Company, by tank car)

(K. W. Barber Company, by truck)

(Richards Oil Company, by truck)

Grade: #6

Analysis of Oils:

Viscosity - 175 to 200 S.S.T. at 100°F

Flash Point - 185 to 200°F

Sulphur - 1.15 to 4.0% maximum

S.B. and A. - 0.2 to 0.5%

Heating Value - 143,500 BTU/gal. average

Consumption, monthly (1958)

Purchased per month - average 27,000 gallons

Cost, monthly (1958)

Average \$5,467.75

Rate, Delivered - average \$.0627/gallon

III. Gas

(Minneapolis Gas Company)

No connection to plant at present.

Rates Available:

1. General Service

First 200 C.F. or less/month	\$1.00
Next 400,000 C.F./month	.00/M.C.F.
Over 500,000 "	"

2. Interruptible Gas Priority Schedule

Priority Classification

A

Volume requirement

Over 1,000 M.C.F./hr.
and less than 500 M.C.F./day

Less than 500 M.C.F./max.
day and more than 2,000
M.C.F./month

More than 500 M.C.F./max.
day, and less than 10,000
M.C.F./month

More than 10,000 M.C.F./
month and less than 20,000
M.C.F./month

More than 20,000 M.C.F./
month and less than 50,000
M.C.F./month

More than 50,000 M.C.F./
month and less than 12,000
M.C.F./max. day

B

C

D

E

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Max. day more than 12,000
K.C.F./day

<u>Classification</u>	<u>Minimum K.C.F.</u>	<u>Monthly \$</u>	<u>Rate for Gas \$/K.C.F.</u>
AA	40	20.04	50.1
A	1,500	601.50	40.1
B	2,000	762.00	38.1
C	4,000	1,444.00	36.1
D	8,000	2,640.00	33.0
E	20,000	6,000.00	30.0
F	Special Contract		26.9

4. Air -

Two compressors for plant use.

1) Worthington compressor; 50 psig; size 10x10; driven by 35 HP G.E. motor, 1200 RPM, 230V, 3 phase, 60 cycle.

2) Chicago Pneumatic compressor; size 14x16 GSS, No. 3107, steam driven, 75-80 psig output.

These compressors provide an adequate supply of plant air.

5. Waste -

Plant waste consists of

1) Surface water

2) Tank farm trench water - surface water, steam condensate, oil and tar spillage.

3) Water from oil-water cut in refinery.

4) Cooling water from refinery and air compressors

5) Laboratory sink

6) Boiler blowdown

7) Water from tank 5 at treating plant

All plant waste flows into a 3" tile which empties into a 7" dia. x 9'-6" high sump from which it is pumped to a 10' x 10' x 30' wooden settling basin. The water layer is piped in an 8" tile through the Omaha tie yard to the property line after which it flows in an open trench to a swamp area with no outlet.

B. Boilers

Two boilers:

1) Riley (Badenhausen) boiler.

Installed - 1940

Sq.Ft. boiler - 2530

Sq.Ft. water walls - 610

Working pressure - 160

Operating pressure - 150

Safety Valves setting 145

Class A.W.O. 50 NY

Condition: This boiler was opened for my inspection on July 13, 1964. The outer shell of the boiler had been repainting twice with 1/16" thick, and up to 1/8" thick in the steam dome.

Up since May 1964 at which time the tubes were swined. The fire-sides were fairly clean. No warped tubes were noticed. Firebrick has deteriorated in several places causing overheating of the outer steel casing. No whistles are installed on the water column. No flame safety device, low water cutoff, or feedwater regulator is

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installed.

Controls - No automatic controls are installed.

Treatment - Nalco balls are used for water treatment under the supervision of the Flox Company, Minneapolis.

Water Analysis -

	Plant Well	Pond	City	
Total Hardness (as CaCO ₃)	17.8 gpg	17.0 gpg	18.2 gpg	
Calcium	10.8	9.8	11.2	
Magnesium	7.1	7.2	7.0	
P Alkalinity	trace	trace	0	
N Alkalinity	16.7	17.4	18.0	
Chlorides (as NaCl)	0.5	0.9	0.4	
Sulfates (as Na ₂ SO ₄)	1.1	0.8	0.5	
Silica (as SiO ₂)	1.5	1.3	1.1	
pH	8.0	8.0	7.5	

Boiler Firemen - 3 licensed firemen at \$1.20/hr.

Boiler Stack - the upper portion of the stack has corroded through and several holes have appeared. The spark arrester is burned through approximately 50%.

Soot Blower - the soot blower was removed from the Ailey boiler due to its failure in service. It has not been replaced. Soot buildup, however, is not critical.

Auxiliaries -

Feedwater heater - Warren-Webster Company; obsolete in design but adequate in heating; installed with 3-1/2 ft. water level above pump suction. No air bleed is installed.

Feedwater pumps - two steam pumps, no nameplates, both in bad condition; both required to feed one boiler.

2) W. Bros. Boiler and Mfg. Co.

150 HP, H&H boiler; working pressure 150 psig; operating pressure 125 psig.

This boiler is used as a standby or for burning wood shavings.

C. Stills

Eight stills in two batteries plus one additional still are in use.

All stills are 30" x 16', Reilly stills, fitted with 4" weighted safety valves but no transite discs. Manometers are installed on all stills and are in operating condition.

Use: 9,10,11,12 for coke; 13,14,15,16 for road tar and roofing pitch; 5,6,7,8,17 not used.

Installation Dates:

13,14	replaced May 1946
15,16	replaced May 1944
17	new bottom April 1943
9,10,11,12	new bottoms April 1947
5,6,7,8	new bottoms April 1945
1,2,3,4	Junk

D. Railroad Tracks

Tracks in general are in fair condition. There are many loose or missing bolts throughout, rotten and broken ties, and numerous worn switch points which should be built up. In several places short patches of track are used to make up gaps between short rails. These should be eliminated by laying proper length rails. In several places

rail ends are broken off causing an excessive gap between rails.

Repairs should be scheduled for the following items:

At junction coke 6 and 7 - bad switch point.

" " coke 5 and 6 - high switch point causing excessive wear.

" " coke 5 and 6 - broken frog point, badly worn frog, switch rail broken, other switch point badly worn.

" " warehouse narrow gauge - frog broken in two places, badly worn throughout.

" " Milwaukee lead - short splice plate should be replaced.

" " 1 and tar cistern - broken rail

Omaha lead - badly worn frog.

2 and 3 - badly worn frog.

3 and 4 - broken switch point.

Omaha lead and 3 - split rail, badly worn frog.

3 narrow gauge and Omaha lead - badly worn frog.

3 narrow gauge and Omaha lead - badly worn frog.

2 and cylinder #1 & #2 lead - badly worn frog.

#1 and #2 cylinder narrow gauge - badly worn frog

2 and #3 cylinder lead - badly worn frog

incisor and a & b mill - broken frog

Milwaukee lead and a & b mill - broken frog

coke 4 and Milwaukee lead - badly worn rail

Milwaukee lead and 7 - badly worn frog

Milwaukee lead and 8 - badly worn frog

Milwaukee lead and Y - badly worn frog

Milwaukee lead and coke 3 narrow gauge - badly worn frog

E. Electrical Installations

No tests are carried out, although a megger is available. Many motors are very dirty, some covered completely with sandust. Low voltage wiring is in poor condition, generally. Lighting wiring along the tank car loading track is very bad. Insufficient yard lighting is installed. Most areas have no outside lighting. High voltage power lines near the office at present run through a large tree.

F. Painting

All storage tanks are in need of paint, particularly number 3. Buildings are brick and require no paint except on the trimming.

G. Maintenance

Two maintenance shops:

1) Blacksmith shop, 23'x12', contains

1 - 200 amp AC arc welder

1 - dust grinder, 11" and 7"

1 - drill press, poor condition

1 - gas welding outfit

Miscellaneous hand tools.

2) Pipe shop, 34'x30'

This shop contains no power tools.

No pipe threading machine is provided.

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Crew:

1 welder at \$1.70/hr.; in addition to welding and cutting does electrical maintenance and pipefitting.

1 maintenance man at \$1.553/hr.; does general maintenance and blacksmith work.

Program:

Breakdown maintenance only is carried out. No preventive maintenance has been organized.

H. Fire Protection

The plant is protected by two independent fire mains.

1) Dry main - supplied by a 500 gpm electric fire pump at 150 psig pump pressure; size 6", supplies 10 - 5" hydrants, each with two 2-1/2" outlets.

2) Wet main - under city water pressure, 60-70 psig; size 8", supplies 8 hydrants, each with two 2-1/2" hose outlets.

One dry chemical foam generator is stored in the fire pump house; two 2-1/2" hose connections.

Two 40 gal. foam extinguishers on carts plus numerous 8-1/2 gal. foam extinguishers are provided. No Ansul dry powder extinguishers are used.

Three hose carts, each containing 500 ft. of 2-1/2" hose are provided.

No automatic sprinklers are installed.

No fire drills, demonstrations, or instruction periods have been held in recent years.

The fire protection at present appears adequate.

I. Safety

Deficiencies were noted as follows:

1) Many winches throughout the treating area use wires badly worn to a dangerous condition.

2) Insufficient yard lighting makes all outside night operations hazardous.

3) The byproducts building leans due to settling of its foundation. Walls and columns of brick construction are broken and make the building hazardous.

4) Standard weight fittings are used on fuel oil piping to the Alley boiler operating with 250 psig oil pressure.

5) High-voltage (4000V) power lines run through branches of the large tree near the office.

6) Roof on storage tank 3 is unsafe for walking on. Tank is out of round and leans considerably. At present the tank is nearly full.

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